REMARKS:

Claims 1, 3, 4, 6, 7 and 8 are presented for consideration.

Claims 2 and 9-12 remain in the case but have been withdrawn pending the possible allowance of a claim that might be generic to these claims.

No further amendments are believed necessary to patentably distinguish the invention over the prior art combinations cited by the Examiner since the arguments already submitted and those which will be reiterated hereunder, are believed to clearly establish that the claimed invention would not be obvious under 35 U.S.C. 103(a) from a combination of the Japanese reference to Hanada with the U.S. patents to Shang et al. and Collins et al., or with the U.S. patents to Shang et al. and Sato et al. (newly cited).

In general terms, it has long been established that the combination of references must be suggested somewhere in the prior art cited or at least in the prior art as a whole. See *In re Jones,* 958 F.2d 347, 21 U.S.P.Q.2d 1941, 1943 (Fed. Cir. 1992).

This case stood for the principle that before the U.S. Patent and Trademark Office may combine the disclosures of two or more prior art references in order to establish *prima facie* obviousness, there must be some suggestion for doing so, found either in the references themselves or in the knowledge generally available to one of ordinary skill of the art.

The court has recognized the use of logical reasoning to reach the cited combination, for example, see *In re Laskowski,* 871 F.2d 115, 10 U.S.P.Q.2d 1397 (Fed. Cir. 1989).

The Board of Appeals and Interferences also recognized this principle of using a logical argument in the case of *Ex parte Levengood, 25* U.S.P.Q.2d 1300, 1301 (B.P.A.I. 1993). In that case the Board indicated that motivation for combining teachings of various references need not be explicitly found in the references themselves. The Board recognized that the Examiner may provide an explanation based on logic and sound scientific reasoning that will support the holding of obviousness. The Board warned however that an Examiner's mere assertion that one of ordinary skill in the relevant art would have been able to arrive at a claimed invention, may be insufficient.

In the present case, the Examiner recognizes that the Hanada reference fails to provide a frequency generator for frequencies greater than 13.56 MHz and also fails to provide a substrate with a greatest dimension of at least 0.7 m. To satisfy the higher radio frequency the Examiner cites Collins et al. Collins like Hanada however is for processing substantially smaller substrates, specifically wafers having a dimension no greater than 8 inches (equal to about 20.3 cm or 0.2 m) at column 7, lines 58-63. Hanada likewise is for the processing of wafer sized substrates which are known to be no more than 30 cm (0.3 m). Thus both Hanada and Collins even if combined would still teach the skilled artisan that substrates of half the dimension and about a quarter of the area than those claimed can be successfully processed.

This brings us to the Shang reference which the Examiner utilizes to disclose a plasma reactor for processing a substrate with a largest dimension up to 1 m, stating "It is well known in the art to scale up or down an apparatus to accommodate the desired substrate size." (Action of Sept. 27, 2004, page 4, lines 4-5). This conclusion is based entirely on the Examiner's statement and has no actual basis in the prior art cited by the

Examiner. When one looks to the reason for providing the apparatus of the present invention, specifically to compensate for standing wave problems (see the specification at page 4, lines 23-27) and appreciates that this phenomenon can not even occur in the smaller size substrates of Hanada and Collins et al., it is appreciated that not only is there no suggestion or logic behind the combination of Shang et al. with Collins and Hanada to reached the claimed invention but in fact that combination is contrary to the Examiner's position that scaling up or down would be obvious.

The effect occurring in the larger substrates to be recognized and solved by the present invention do not even occur in the Collins and Hanada references but would occur in the Shang reference which is missing the other key features of the combination of claim 1. Shang provides uniform capacitates across the device and does not mention the high radio frequency requirement of claim 1 nor does the Shang patent, read in its entirety, address the standing wave issue or suggest a solution for the standing wave problem (which is also clearly missing from Collins et al. and missing from Hanada).

Thus, in concluding that it would be obvious to scale up the Collins and Hanada structure to a structure large enough to accommodate the larger substrates of Shang et al., is not a logical combination because of the different phenomenon occluding in the larger scale device, and also is clearly not supported by the references themselves.

The dependent claims distinguish the invention even further from this combination of references and it is believed that Examiner has not established a *prima facie* case of obviousness with the combination of Hanada, Shang et al., and Collins et al.

The Examiner has also rejected claims 1, 3, 4 and 6-8 as being obvious from a

combination of Hanada and Shang et al. taken further with U.S. patent 6,199,505 to Sato et al.

While Sato does discuss the need for larger plasma processing apparatus at column 2, lines 34-43, including substrates of 1 meter square, nowhere in this entire newly cited reference is the standing wave problem discussed nor is any solution for this unrecognized problem suggested. Shang adds nothing in this regard and is cited by the Examiner again for the premise that scaling up or down would be obvious to the person of ordinary skill in the art.

In the Examiner's response to Applicant's previous comments, the Examiner states "It should be noted that one cannot show unobviousness by attacking references individually where the rejections are based on a combination of references." (Action from page 8, lines 9-11). The Examiner's comment is not actually relative to the remarks that were in fact presented, however, since Applicant had previously, and continues to argue that it is the combination that is not obvious because of the non existing standing wave problem and the non existing solution to that problem from any obvious combination of the references. It is the "combination" which has always been argued as not obvious and there has been no "attacking references individually" as stated by the Examiner.

The Examiner states without support that "Collins et al and Sato et al. give motivation to use higher frequencies." (Action at page 8, lines 12-13). The Examiner is requested to identify where that motivation lies, either in the references cited, in other references, in examples of the prior art or by a logical combination of the references, particularly in view of the lack of the standing wave problem in any of the references, nor any solution directed to that problem.

The Examiner cites Sato at column 2, lines 31-34 stating that this section "teaches it is conventional known to scale up an apparatus in order to accommodate a larger substrate." (Action at page 9, lines 15-16). This section of Sato in facts reads:

> "With apparatus which has such a construction the external dimensions of the outer wall 12 of the vacuum chamber become very large ads the substrates become larger, and the weight of the apparatus is increased."

This passage does not generalize the concept that it would be obvious to scale any apparatus up or down but is focused only to the specific teaching of Sato et al. indicating that a larger chamber is necessary to accommodate the larger substrates. There is no identification of different problems that occur or different solutions to those problems. Turning to what is actually disclosed in the Shang et al. reference in the passages cited by the Examiner at column 5, lines 60-63 and column 6, lines 55-67, these sections respectively read:

> "This allows the processing of a glass substrate for flat panel displays of up to about 1 square (m^2). The size of support plate 20 is scalable to accommodate either larger or smaller substrates."

> "The power of plasma 169 may be relatively low, such as in a range of about 100 watts to 1000 watts for a chamber having a volume of 250 cubic centimeters and a substrate processing area of 550 x 650 mm^2; the power would scale up or down for chambers of larger or smaller volumes, or larger or smaller substrate processing areas, respectively. For example, as the power scales with the size of substrate 165, a useable range of power densities may be 0.02 watts per square centimeter to 0.5 watts per square centimeter of substrate area. As the power also scales with the volume of chamber 133, a usable range of power densities may be 0.4 watts per cubic centimeter to 4 watts per cubic centimeter of chamber volume."

These sections of Shang et al. do indicate that sizes can vary within the teaching of Shang et al. and the words "scalable" and "scales" are used in these sections of Sato and Shang. It is not seen how this can demonstrate the broader principle that the Hanada device (Hanada says nothing about scalability) can be scaled up with regard to a size and radio frequency range in an obvious manner to achieve the solution to an entirely new and undisclosed problem, that of standing waves to be solved by the present invention, in any obvious manner.

The examiner is respectfully requested and urged to reconsider the claims in light of the foregoing comments and find them to be patentable over the cited combinations of references and in condition for allowance.

Respectfully submitted,

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